Frontier

Owners Manual – V6 all models

Magic MOBILITY

1 Power Wheelchair Owner's Manual

Thank you for choosing a Magic Mobility Product. We are proud of the quality construction of every chair we build. This owner's manual explains the operation of your new chair. Please read it carefully as it contains important safety, care and maintenance information.

Magic Mobility's Power Wheelchair series may be custom made to measure and may vary in detail from chair to chair however they should all comply to the enclosed basic specifications.

As a manufacturer of wheelchairs, Magic Mobility endeavours to supply a wide variety of features and options to meet the needs of the user. However, final selection and specifications of the type of wheelchair to be used by any individual rests solely with the user and his/her healthcare professional capable of making such a selection.

All of the information and specifications in this document are current at the time of printing. However due to our policy of continual product improvements we reserve the right to make changes at any time without notice. This may lead to slight variations between the illustrations and explanations in this manual and the model you have purchased.

1.1 Intended Use

The intended use of Magic Mobility Power Wheelchair's is to provide mobility to persons with a maximum weight of 401 lbs. limited to a sitting position, that have the capability of operating a powered wheelchair.

If you experience any problems with your power chair that you are unable to solve, or if you do not feel capable of safely following any of the instructions and/or recommendations as contained in this manual, please contact your Magic Mobility dealer. You will find the model designation and serial number of the wheelchair on the base of the frame.

Magic Mobility is not liable for damage to property or personal injury arising out of unsafe use of a power chair. Magic Mobility is also not liable for any property damage or personal injury arising out of the failure of any person and/or user to following the instructions and recommendations set forth in this manual.

SEATING ARRANGEMENT	MAXIMUM USER WEIGHT
No seat elevator fitted	401 lbs
Seat elevator fitted	341 lbs

2 Safety and Damage Warnings

Throughout this manual, you will find the following safety and damage warnings.

	WARNING! This is a warning which, if ignored, may cause injury to yourself and other people
	STOP! This is an instruction that, if not followed, may result in damage to your Power chair. It means 'do not do this' or 'do not let this happen'.

Contents

1 Power Wheelchair Owner's Manual 2
1.1 Intended Use 2
2 Safety and Damage Warnings 2
3 Safety 5
3.1 Transfers 5
3.2 Motor Vehicle Transport 5
3.3 Weight Limitations 6
3.4 Stairs and Escalators 6
3.5 Transportation Products .....
3.6 Public Streets and Roadways 6
3.7 Stationary Obstacles: (Steps, Curbs, Etc.) 6
3.8 Climbing or Descending an Incline 7
3.8.1 Maximum Recommended Incline 7
3.9 Removable Parts 8
3.10 Cornering Information 8
3.11 Electromagnetic Fields (for more information see section 10) 8
3.12 Positioning Belts 8
3.13 Weather Precautions 9
3.14 Reaching and Bending 9
3.15 Prescription Drugs/Physical Limitations 9
3.16 Alcohol 9
4 Specifications 9
4.1 The Frontier 9
4.2 Features and Options 9
4.3 Performance Attributes 10
5 Operating Instructions 11
5.1 Performance adjustments 11
5.2 Comfort adjustments 11
5.3 Freewheel Mode – pushing the power chair 11
5.4 Tilt in space seat option – if applicable 12
5.5 Power elevating seat option – if applicable 12
6 Joystick controls 20
6.1 Joystick power 20
6.2 Rain and Water 20
6.3 Joystick lead 20
6.4 Controller program 20
6.5 Hand control joystick operation 21
6.5.1 The Screen 21
6.5.2 The Status Bar 21
6.5.3 System Lock 22
6.5.4 On/Off Button 22
6.5.5 Sleep Mode 22
6.5.6 Attendant Mode 22
6.5.7 Drive Mode 22
6.5.8 Accessory Mode 23
6.5.9 On Board Programming 23
6.5.10 Lighting Mode (if applicable) 25
6.5.11 Charging 25
7 Batteries & Charging 26
7.1 Batteries 26
7.2 Battery Charging 26
7.3 Charging Procedure 26
To get the maximum range from your batteries: 27
7.4 Public Transportation 27

7.5 Battery Disposal and Recycling 27
8 Care & Maintenance 27
8.1 General Guidelines 27
8.2 Batteries 28
8.3 Tires and Castors 28
8.3.1 Tire Inflation 28
8.3.2 Tire Wear 29
8.4 Upholstery 29
8.5 Cleaning 30
8.6 Storage 30
8.7 Transportation 30
8.8 Daily Checks 30
8.9 Weekly Checks 30
8.10 Annual Checks 31
9 Servicing 31
10 Fault finding 32
10.1 Limp Mode 32
10.2 Stuck Power Button 32
10.3 Joystick out of neutral at power up 32
10.4 Battery Warning Conditions 32
10.5 Fault Codes 32
10.6 Electromagnetic Interference (EMI) From Radio Wave Sources 33
10.7 Powered Wheelchair Electromagnetic Interference (EMI) 34
11 Warranty 35
12 Head Office and Operations 35

3 Safety

Please read and follow all instructions in this owner's manual before attempting to operate your power chair for the first time. If there is anything in this manual you do not understand, or if you require additional assistance for setup, contact your Magic Mobility Dealer before operating the wheelchair.

There are certain situations, including some medical conditions, where the power chair user will need to practice operating the power chair in the presence of a trained attendant. A trained attendant can be defined as a family member or care professional specially trained in assisting a power chair user in various daily living activities.

The contents of this manual are based on the expectation that a qualified healthcare professional has properly fitted the power chair to the user and the prescribing healthcare professional has trained the user in the operation of the wheelchair, the dangers that can be encountered and assured themselves that the user is capable of this.

Using your Magic Mobility product safely also depends upon your own good judgement and/or common sense, as well as that of your provider, caregiver, and/or health professional. Magic Mobility is not responsible for injuries and/or damage resulting from any person's failure to follow the warnings, cautions and instructions in this owner's manual.

	WARNING! If you are going to be stationary in your power chair for an extended period of time, turn off the power. This will conserve battery power and remove the chance of unexpected chair movement through inadvertent joystick contact or from electromagnetic sources

3.1 Transfers

It is recommended that you have a trained attendant present while you learn to transfer yourself. To reduce the chance of injury, we recommend:

- Be sure the power is turned off (See section 6.5.4)
- Be sure the Power chair is not in freewheel mode (See section 5.3)
- Ensure armrests and footrests are swung away or removed
- Position yourself as far back as possible in the power chair seat to prevent the power chair from tipping forward.

	WARNING! Avoid putting all your weight on either armrests or footrests. This may cause the power chair to tip and cause injury
	STOP! Avoid putting all your weight on either armrests or footrests. This may damage their supports.

3.2 Motor Vehicle Transport

Wheelchair positioning belts are not designed with the intent of providing proper restraint during motor vehicle transportation. A WC19 and ISO7176-19 compliant system is available from Magic Mobility. More information is contained in section 5.6.

If it is necessary to use a transportation product such as a hoist or lift, Magic Mobility recommends that the manufacturer's instructions and specifications are closely reviewed before using that product

3.3 Weight Limitations

Your power chair is rated for a maximum weight capacity of 401 lbs. Do not carry passengers or heavy weights on any part of the wheelchair.

SEATING ARRANGEMENT	MAXIMUM USER WEIGHT
No seat elevator fitted	401 lbs.
Seat elevator fitted	341 lbs.

	WARNING! Exceeding the weight capacity voids your warranty and may result in personal injury.
	STOP! Exceeding the weight capacity voids your warranty and may result in damage to your power chair.

3.4 Stairs and Escalators

	WARNING! Never use your power chair to negotiate stairs or escalators. Always use an elevator or lift. You may cause injury to yourself and to others.
	STOP! Trying to negotiate stairs or escalators may result in damage to your power chair.

3.5 Public Streets and Roadways

	WARNING! You should not operate your power chair on public streets and roadways. Be aware that it may be difficult for traffic to see you when you are seated on your power chair. Obey all local pedestrian traffic rules. Wait until your path is clear of traffic, and then proceed with extreme caution

3.6 Stationary Obstacles: (Steps, Curbs, Etc.)

Proceed with extreme caution when driving near raised surfaces, unprotected ledges, and/or drop-offs (curbs, porches, stairs, escalators, elevators, etc). Always approach an obstacle so both front wheels touch that obstacle together. Never attempt to climb a curb or obstacle at an angle.

	WARNING! Do not attempt to have your power chair climb or descend an obstacle that is higher than 2 in. unless you have the assistance of an attendant. Never try to travel backwards down any step, curb, or other obstacle. This may cause the power chair to tip and cause personal injury.

3.7 Climbing or Descending an Incline

When climbing an incline, try to keep your power chair moving; however do not use excessive speed. If you must stop, start up again slowly and then accelerate cautiously. Your mid wheel drive power chair has 4 castor wheels and two drive wheels for enhanced performance. At times, particularly during high acceleration on inclines, not all of the 4 castor wheels will contact the ground. This is a normal part of the chairs operation; if at anytime you feel uncomfortable, reduce your acceleration rate.

When driving down an incline, set your power chair to the slowest speed setting and drive in the forward direction only. If your power chair starts to move down the incline faster than you anticipated or desired, allow it to come to a complete stop by releasing the joystick. Once the chair has stopped push the joystick forward slightly to ensure a safely controlled descent.

The following advice is recommended for your safety:

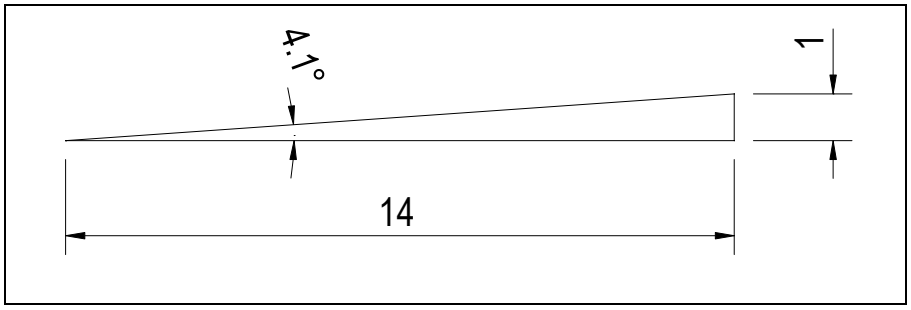
- Stop before climbing an obstacle. Approach slowly until castors contact the obstacle. Apply power and the action of the chair will lift the castors over the obstacle. Weight is transferred to the drive wheels providing traction and motor strength to power the chair over the obstacle.
- Do not drive at an angle up or down the face of the incline. Drive your power chair straight up or down the incline. This greatly reduces the possibility of tipping the chair over
- Avoid potentially hazardous inclines e.g. areas covered with snow, ice, mud, cut grass, or wet leaves.
- When on any sort of an incline or decline, never place the power chair in freewheel mode while seated on it or standing next to it.
- Never attempt to travel backwards down an incline.

	WARNING! Always exercise extreme caution on inclines and follow the advice above to reduce the risk of personal injury

3.7.1 Maximum Recommended Incline

Most public access ramps have a maximum gradient 1 in 14 (AS1428.1). Therefore, Magic Mobility recommends that the maximum slope of an incline you attempt to safely ascend or descend on your power chair does not exceed a 1 in 14 gradient.

	WARNING! Any attempt to climb or descend a slope steeper than 1 in 14 gradient may put your power chair in an unstable position and cause it to tip, resulting in personal injury.



3.8 Removable Parts

	WARNING! Do not attempt to lift or move a power chair by any of its removable parts. This may result in personal injury.
	STOP! Do not attempt to lift or move a power chair by any of its removable parts. This may cause damage to the chair.

3.9 Cornering Information

Despite front and rear castor wheels, excessively high cornering speeds can still create the possibility of tipping. If you feel that you may tip over in a corner, immediately reduce your speed and steering angle (i.e. lessen the sharpness of the turn)

The following advice is recommended for your safety:

- Reduce cornering speed
- Reduce steering angle
- Beware of uneven, rough and slippery terrain
- Avoid turning on inclined surfaces
- Be aware of changing surfaces - such as passing from a paved area to a gravel area at high speed while turning
- Avoid abrupt directional changes.

	WARNING! When cornering, lower your speed and follow the advice above to reduce the risk of personal injury

3.10 Electromagnetic Fields (for more information see section 10)

Your power chair's performance may be influenced by electromagnetic fields caused by mobile telephones or other radiating devices, such as hand-held radios, radio and television stations, wireless computer links, microwave sources, and pagers.

Your power chair may also be a source of electromagnetic and radio frequency interference. Be aware that your power chair may affect the performance of alarm systems and other radiating devices.

	WARNING! Turn off your power chair when using products, which emit electromagnetic fields. This will eliminate the possibility of unintended movement caused by electromagnetic sources. Failure to take this precaution may result in personal injury

3.11 Positioning Belts

Do not use the positioning belt on your power chair as a restraint for transportation in a motor vehicle.

It is the obligation of the purchasers, therapists and other healthcare professionals to determine if a positioning belt is required to ensure the safe operation of this equipment by the user.

	WARNING! Ensure your positioning belt is fastened securely. Serious personal injury may result if you fall from the power chair.

3.12 Weather Precautions

	WARNING! Do not operate your power chair in icy or slippery conditions or on salted surfaces (i.e.; footpaths and roads). Such use may adversely affect the performance and safety of your power chair, resulting in an accident and personal injury.

3.13 Reaching and Bending

	WARNING! Do not bend, lean, or reach for objects, if you have to pick them up from the floor we suggest you use a specially designed “Pick Up Stick”. Movements such as these may cause your power chair to tip, possibly resulting in personal injury.

3.14 Prescription Drugs/Physical Limitations

Consult your physician if you are taking prescribed or over-the-counter medication or if you have certain physical limitations.

	WARNING! Some medications and limitations may impair your ability to operate your power chair in a safe manner, possibly resulting in personal injury to yourself and others.

3.15 Alcohol

	WARNING! Do not operate your power chair while you are under the influence of alcohol, as this may impair your ability to operate your power chair in a safe manner, resulting in personal injury to yourself and others.

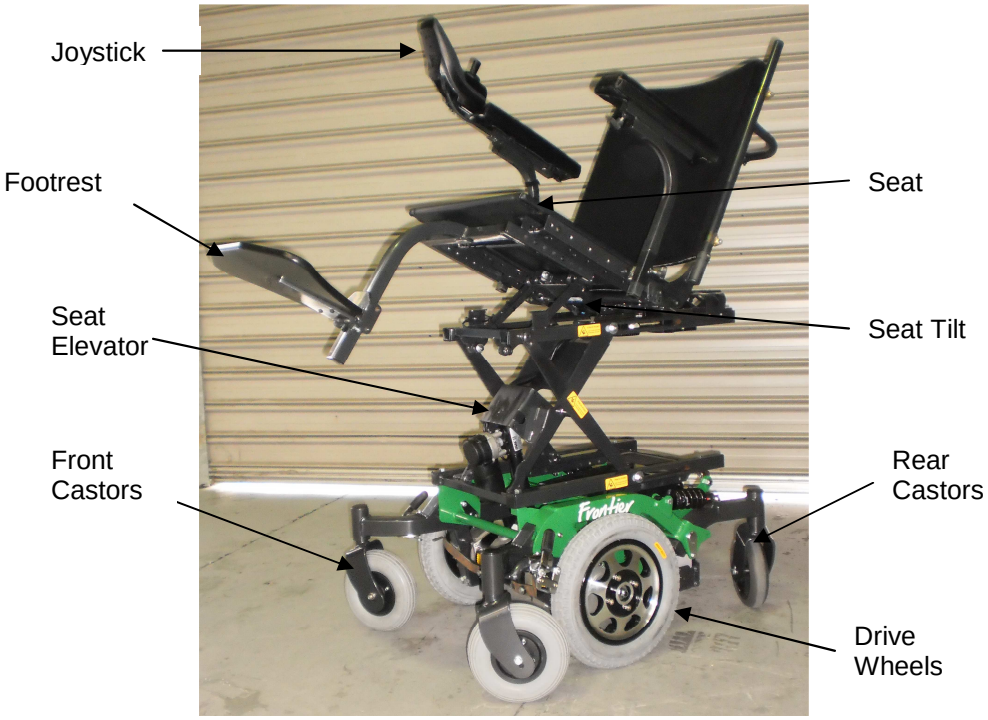
4 Specifications

4.1 The Frontier

A Frontier power chair is depicted below. This figure will help you identify some of the features referred to throughout this manual.

4.2 Features and Options

Every individual has different requirements and at Magic Mobility we pride ourselves on being able to meet the needs of most people. Many aspects of the power chair are customizable including, but not limited to controllers, seats, seat back recline mechanisms, armrests, headrests and leg rests. Please contact your Magic Mobility Dealer to discuss any additional requirements, including advice on how to operate these features.



4.3 Performance Attributes

Information regarding the performance attributes and controlled testing results of the power chair may be obtained from the power chair manufacturer. If you would like access to this information, please contact your Magic Mobility Dealer.

All results meet at least the minimum performance requirements of AS3695

Test Method	Test Title
AS 3691.1	Determination of static stability
ISO7176-1:1999	Determination of static stability
AS 3696.2	Determination of dynamic stability
ISO7176-2:2001	Determination of dynamic stability

AS 3696.3	Determination of the efficiency of the brakes
ISO7176-3:2003	Determination of the efficiency of the brakes
AS 3696.4	Determination of energy consumption
AS 3696.6	Determination of maximum speed, acceleration and deceleration
ISO7176-6:2001	Determination of maximum speed, acceleration and deceleration
ISO7176-7	Seating and Wheel Dimensions
AS 3696.8 (Int.)	Static, impact and fatigue tests
AS 3696.9:1990	Climatic Tests
ISO7176-9:2001	Climatic Tests
AS 3696.10	Determination or obstacle climbing ability
AS 3696.14 (Int)	Power and control system

5 Operating Instructions

The speed and direction of the power chair is controlled with by the joystick

- Turn on your power chair (see figure 3 in section 6.5.4)
- Use the joystick to control the speed and direction of travel

At times, particularly during high acceleration on inclines, not all of the 4 castor wheels will contact the ground. This is a normal part of the chairs operation; if at anytime you feel uncomfortable, reduce your acceleration rate or speed.

5.1 Performance adjustments

Performance adjustments to your power chair should only be made by professionals of the healthcare field, or by persons fully conversant with both this process and the driver's capabilities.

	WARNING! Changing the performance settings could adversely affect your power chair. You may cause injury to yourself and to others.
	STOP! Incorrect settings could cause damage to the chair and to surrounding property.

5.2 Comfort adjustments

If your power chair was configured at your Magic Mobility Dealer, please consult your health care professional before changing the seat position or making any other adjustment. Some adjustments may degrade your power chair's performance and safety by changing its center of gravity.

5.3 Freewheel Mode – pushing the power chair

Located on each side of the chair, in front of each drive wheel is a motor release lever (see figure 2). To disengage the built-in or "running" brakes simply push the down levers on each side.

Figure 2 Motors engaged Motors disengaged

The wheelchair controls will not function and the “status” light on the joystick will flash when the chair is in free-wheel mode. This feature has been intentionally incorporated to protect the user from unsafe situations. These levers are intended for use by the attendant.

Don’t forget to push the levers back in again firmly after manually positioning the chair

	WARNING! Do not use your chair in freewheel mode or attempt to place your chair into freewheel mode without an attendant present. You may cause injury to yourself and to others. Do not place your power chair in freewheel mode while on an incline. The chair could roll uncontrollably on its own, leading to injury to yourself and others. WARNING! When the power wheelchair is in freewheel mode, the braking system is disengaged.

5.4 Tilt in space seat option – if applicable

To operate the Tilt In Space Seat:

- Bring your power chair to a complete stop on a flat level surface.
- Always fasten the positioning belt when operating the Tilt In Space seat.
- Push the ‘Accessory Mode Selection’ button on the DX2 joystick. Select Tilt In Space by moving the joystick left or right. Once the Tilt In Space option is highlighted, moving the joystick forward or backwards will operate the function.
- Once the seat reaches its highest tilt angle, the tilt action stops; release the joystick at this point.
- Before driving, return the seat to its upright position. When returning to the upright position, always be sure that the mechanism has reached its lowest limit or normal seated position.

	WARNING! Never tilt the seat from its upright position on an inclined surface or on bumpy or uneven surfaces. Never raise the Tilt In Space seat while your power chair is in freewheel mode. Failure to heed this warning can result in the power chair tipping over and causing personal injury.
	STOP! Do not put your fingers, toes or anything into the tilt mechanism while it is operating. Serious personal injury will occur.

5.5 Power elevating seat option – if applicable

The power elevating seat will allow more freedom and independence, by extending your level of reach. The seat height can be adjusted to match a surface to which you are transferring.

When the seat is fully elevated, the user is closer to eye level of standing persons enabling more enjoyable interactions.

Seat elevators are sometimes referred to as scissor lifts; this for good reason. Under no circumstances should you put your hands, fingers, toes or any part of your body in the seat elevator mechanism while it is operating. Be careful that nobody else has any part of their body in the seat elevator mechanism while it is working.

To operate the power elevating seat:

- Bring your power chair to a complete stop on a flat level surface.
- Always fasten the positioning belt when operating the power elevating seat.
- Push the 'Accessory Mode Selection' button on the DX2. Select power elevating seat by moving the joystick left or right. Once the power elevating seat option is highlighted, moving the joystick forward or backwards will operate the function.
- Once the seat reaches its highest elevation, the action stops; release the joystick at this point.
- Before driving, always be sure that the mechanism has returned the seat to its lowest position.

The power seat elevator is fitted with a system that reduces the speed of the power wheelchair when the seat has been elevated a small amount.

	WARNING! Fasten the positioning belt when using the seat elevator WARNING! Never elevate the seat from its lowest position on an inclined surface WARNING! Never raise the seat when crossing bumpy or uneven surfaces WARNING! Do not put the power wheelchair into freewheel mode with the seat elevated WARNING! Maintain recommended tire pressures for good stability
	STOP! Do not put your fingers, toes or anything into the scissor mechanism while it is operating. Serious personal injury will occur.

5.6 ANSI/RESNA WC/Vol 1 – Section 19 and ISO7176-19 restraint system; if applicable.

This wheelchair conforms with the requirements of ANRI/RESNA WC/19 and ISO7176-19. Magic Mobility recommends that wheelchair users are NOT transported in vehicles of any kind while in wheelchairs. The Department of Transportation has not approved any tie-down system for transportation of a user while in a wheelchair in a moving vehicle of any type. It is Magic Mobility's position that users of wheelchairs should be transferred into appropriate seating in vehicles for transportation and use be made of the restraints made available by the auto industry.

NOTE:
ANSI = American National Standards Institute
RESNA = Rehabilitation Engineering and Assistive Technology Society of North America
ISO = International Organization for Standardization

Only wheelchairs which fit in the following seat size ranges should be occupied in a motor vehicle: 330 to 560 wide and 380 to 560 deep.

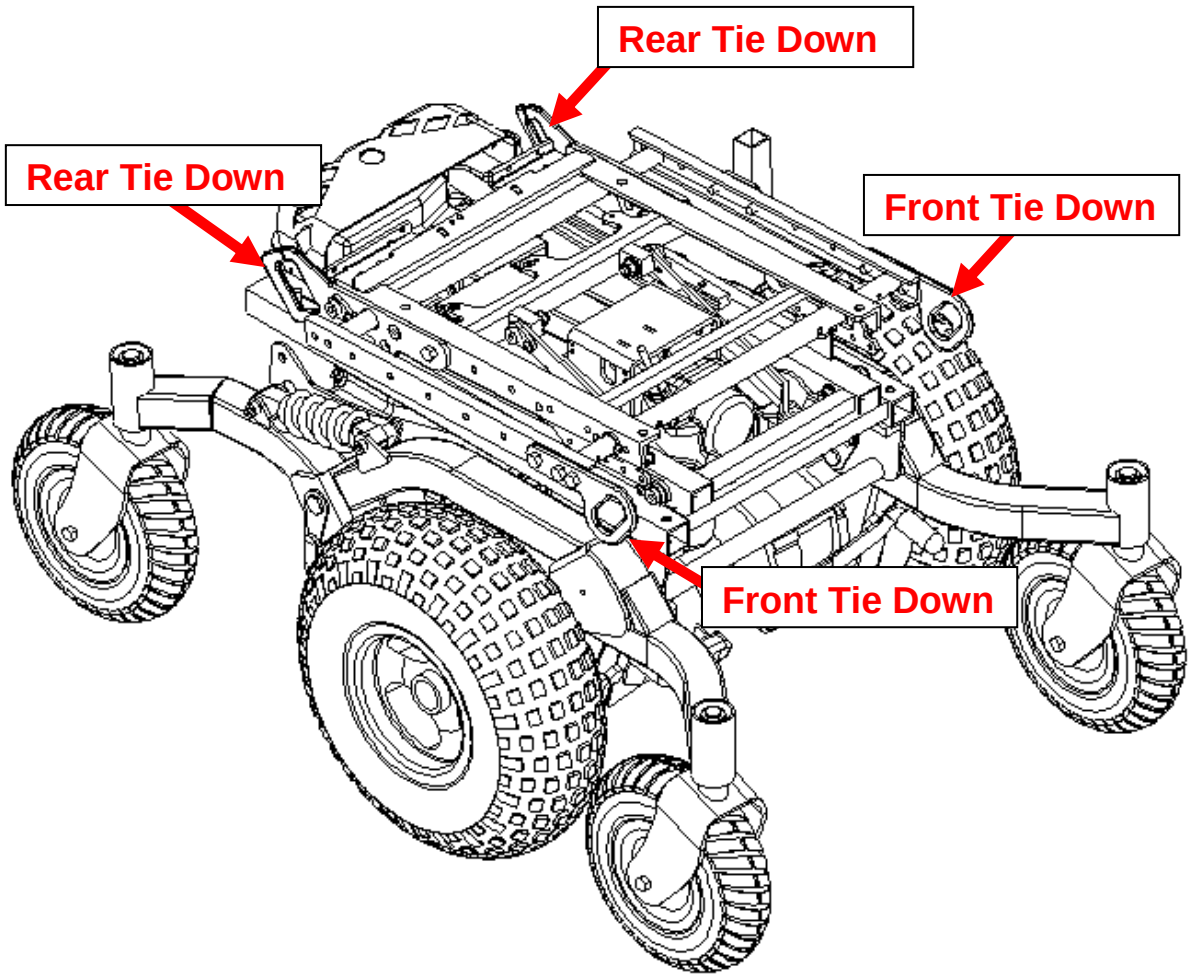


Figure 3 Frontier wheelchair with seat removed showing locations of front and rear tie downs used in the frontal impact test

The Magic Mobility Frontier wheelchair is to be used only with wheelchair tie downs and occupant restraint systems that have been installed in accordance with the restraint manufacturer's instructions and SAE J2249. Attach the wheelchair tie downs and occupant restraint system to the tie down brackets in accordance with the manufacturer's instructions and SAE J2249.

The tie down fittings have a rectangular aperture 25mm x 50mm. Any hook or loop of the restraint end fitting must fit through this hole.

The wheelchair has been dynamically tested with a wheelchair anchored pelvic belt as per the requirements in Annex A of WC19 and ISO7176-19. The belt anchor points are shown in figure 3. The seatbelt is anchored over a 14mm spigot by an M8x20 Grade 12.9 button head socket screw. Do not replace the pelvic belt with a different style of pelvic belt; the belt supplied is designed to accommodate use on either side of the vehicle. The belt is equipped with standard interconnect hardware to enable attachment of suitably equipped vehicle anchored shoulder belts. See Figure 4. The free end of the vehicle anchored shoulder belt is installed over the shoulder belt connection pin.

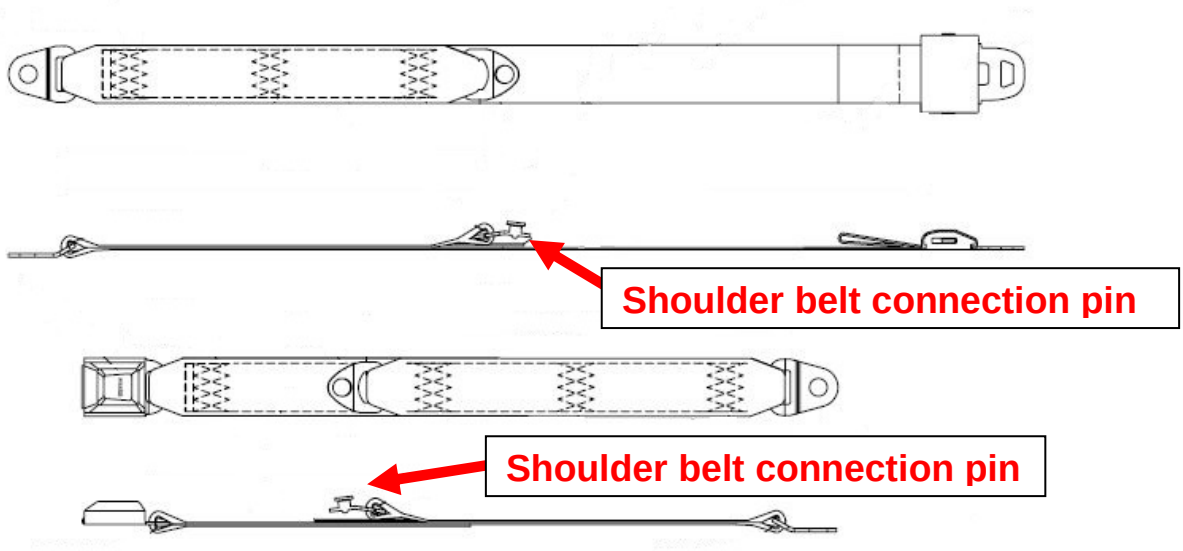


Figure 4 The wheelchair anchored pelvic belt

The wheelchair is not provided with a wheelchair anchored belt restraint as standard. It must be requested at the time of ordering the wheelchair or it can be retrofitted later on by a Magic Mobility Representative. The Magic Mobility supplied wheelchair anchored restraint system conforms with WC19 and ISO7176-19 including section 4.9.2 through 4.9.5 and 5.2, and it has been used in the dynamic test of Annex A for compliance with 5.3.

The pelvic belt should be worn low across the pelvis so that the angle of the pelvic belt is within the preferred zone of 45° to 75° to the horizontal. Belt restraints should not be held away from the body by the wheelchair components or parts, such as the wheelchair armrests or wheels, see figures 5 and 6. Upper torso belts should fit over the shoulders.

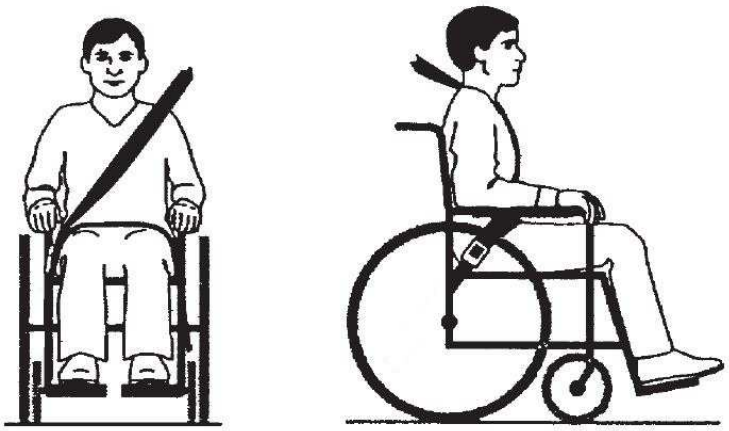


Figure 5 Correct positioning of belt

Figure 5 Incorrect positioning of belt

Pelvic restraints should make full contact across the front of the body near the junction of the thigh and pelvis. Adjust the belt restraints to be as snug as possible while bearing in mind the comfort of the occupant. Don't allow the belt webbing to twist and reduce the area of contact of the belt with the occupant. Figure 6 gives an overall view of an occupant restrained in a vehicle using wheelchair anchored tie downs and vehicle anchored tie downs if used.

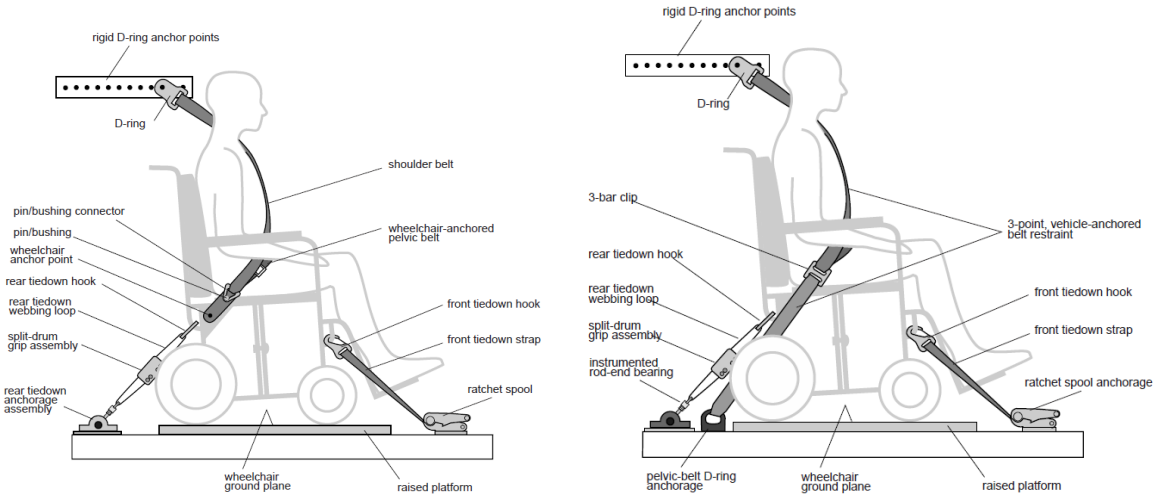


Figure 6 overall view of occupant restrained in vehicle

This wheelchair has an overall rating of 17 with regard to accomodating the use and fit of vehicle ancored belts. This rating is scored as follows:

Rating	Description
A	Excellent
B	Good
C	Fair
D	Poor

The test for lateral stability displacement for point P is shown in figure 7. The average result for point P is 380mm

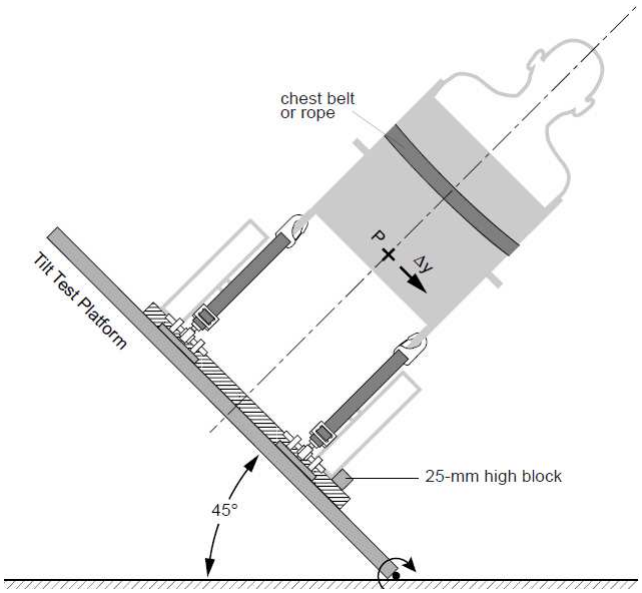
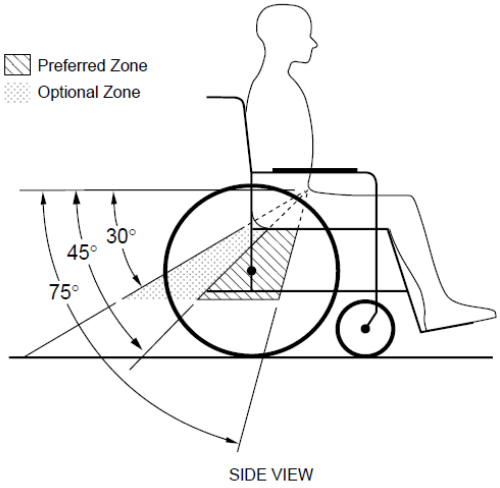


Figure 7 Rear view of wheelchair and test dummy secured on test platform and tilted to 45°

WARNINGS
The wheelchair must only be used for forward-facing seating during travel in a motor vehicle
The wheelchair should be used as indicated in the manufacturer's instructions
The wheelchair has been dynamically tested in a forward facing mode with the ATD (test dummy) restrained by both pelvic and shoulder belts. Both of these belts should be used in order to reduce the possibility of head and chest impacts with other vehicle components
The wheelchair must only be used for forward-facing seating during travel in a motor vehicle
Magic Mobility wheelchairs do not provide a location for anchoring of a pelvic belt unless requested. The anchorage forms part of the tie down rings which are available separately. Postural supports and belts may be used in addition to the vehicle belt restraints; postural belts are NOT a substitute for vehicle restraints that have been designed and tested for this purpose

A side view pelvic-belt angle of 45° to 75° to the horizontal is preferred to lower pelvic belt angles.

NOTE 1: Steeper side-view pelvic-belts angles are especially important if the pelvic-belt is intended to be used for postural support in addition to the occupant restraint in a frontal crash. Steeper angles will reduce the tendency for a vertical gap to develop between the user and the belt due to compliance of seat cushions and belt movement, thereby reducing the tendency for the user to slip under the belt and for the belt to ride up on the soft abdomen during normal use.



SIDE VIEW

NOTE 2: Steeper belt angles also reduce the tendency for the upper torso belt to pull the pelvic belt onto the abdomen during frontal impact loading

If the wheelchair is not equipped with a belt restraint that complies with WC19 and ISO7176-19 or if the wheelchair user chooses not to use such a device then a vehicle anchored belt restraint system should be used in accordance with the manufacturer's instructions

Auxiliary wheelchair equipment should be effectively secured to the wheelchair, or removed from the wheelchair and secured in the vehicle during transit, whenever possible, so that it does not break free and cause injury to vehicle occupants in a crash

Wheelchair mounted trays not designed for crash safety should be removed and stored separately in the vehicle or be secured to the wheelchair but positioned away from the occupant with energy absorbing padding placed between the occupant and the tray

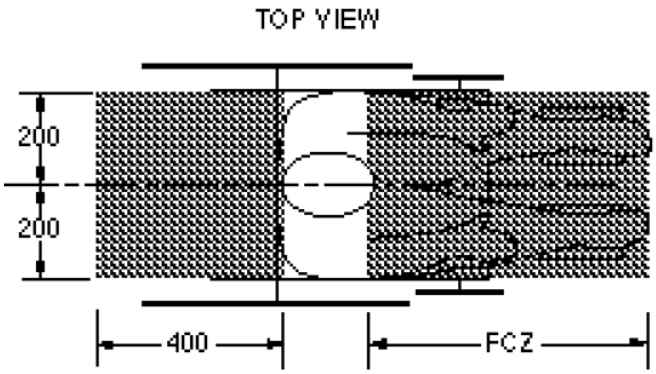
In the case that there are any questions regarding using the wheelchair for seating in a motor vehicle, please contact your Magic Mobility Dealer.

Alterations should not be made to the wheelchair structural and frame parts without consulting Magic Mobility

The recommended clear zones for wheelchair seated occupants restrained by both pelvic and shoulder restraints and only a pelvic belt are shown below

Frontal clear zones (FCZ) need to be larger when the shoulder belt is not used

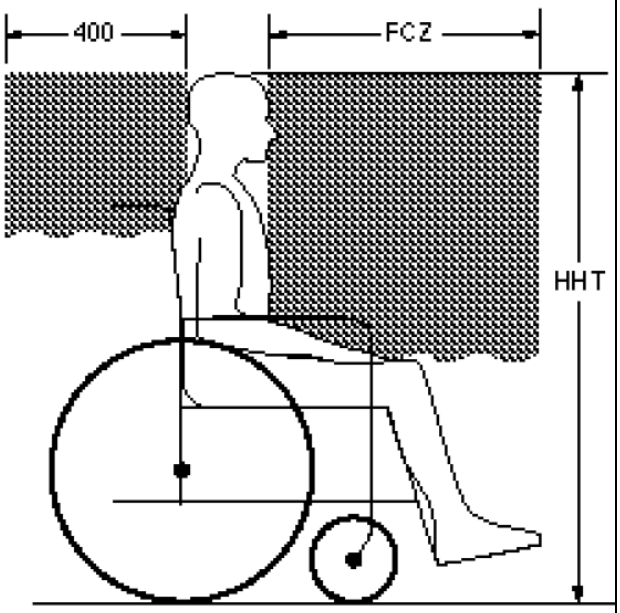
The rear clear zone of 400mm is measured from the rearmost point on an occupants head. The frontal clear zone is measured from the front-most point on the occupant's head.



HHT is the estimated seat height from the wheelchair ground plane to the top of the wheelchair seated occupants head. HHTs range from around 1040mm for a small adult female to 1550mm for a tall adult male

The FCZ = 660mm with pelvic and shoulder belts and 940mm with only a pelvic belt

The frontal clear zone may not be achievable for wheelchair seated drivers.



It is recommended that spill proof batteries such as "gel-cell" are installed on wheelchairs when used in a motor vehicle.

Backrests of wheelchairs with adjustable recline angles should not be tilted to more than 30° to the vertical when occupied during transit in a motor vehicle unless absolutely necessary

In the case that the total wheelchair mass is greater than 125Kgs (275 lbs) then transportation in vehicles with a gross vehicle weight of greater than 4000Kgs is desirable when the option exists

6 Joystick controls

A detailed manual for the DX2 joystick is available from Dynamic Control's website: www.dynamiccontrols.com.

The joystick controls may be customized and may be one of a number of different models depending upon users requirements. This manual contains information on the standard joystick control.

6.1 Joystick power

If the power chair begins to move in an unexpected manner, immediately release the joystick and turn the wheelchair off. Unless the joystick is damaged, this should stop your power chair.

If the joystick is not in the neutral (center) position when you turn on the power, you may cause a fault in the system. Releasing the joystick and turning the power off and on again will reset the system.

	WARNING! Always turn the power off when you are stationary to prevent unexpected movement.

6.2 Rain and Water

The joystick hand control unit IS NOT WATERPROOF. The joystick module is splash proof but may be permanently damaged if water transgresses the rubber seals (this damage is not covered under warranty).

We recommend carrying a plastic bag large enough to cover the joystick module and the user's hand, in case of rain.

6.3 Joystick lead

If for any reason, the joystick lead is disconnected take care when reconnecting, do not force the plug into the socket. The lead is polarized and should only be fitted one way.

	STOP! Forcing the plug into the socket the wrong way can permanently damage the electronics system. Also, do not place the lead so that it can be pinched in the seat frame or the power base frame.

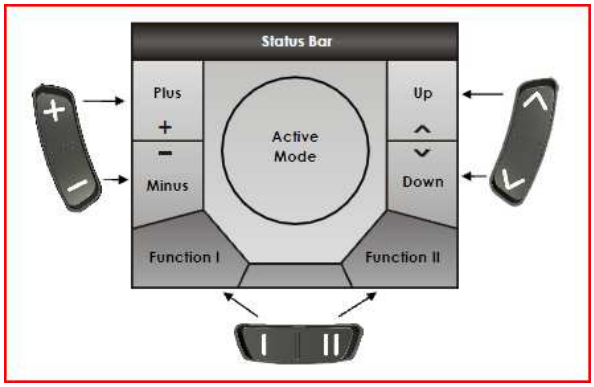
6.4 Controller program

The controller program affects speed, acceleration, deceleration, and braking. The drive mode settings are preset at the factory. If your Magic Mobility Dealer changes these settings, please make note of these changes.

	WARNING! Do not attempt to reprogram your chair. Only the power chair manufacturer, an authorized representative of the manufacturer, or a trained service technician should program the controller.

6.5 Hand control joystick operation

6.5.1 The Screen

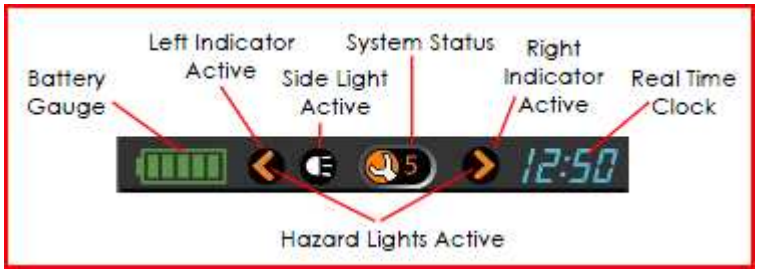


The status bar is located at the top of the screen. The status bar shows the battery gauge, the lighting icons, the system status and the real time clock.

The area at the center of the screen shows the mode that is currently active.

The areas at the sides of the screen show the modes that will become active if the menu navigation buttons are pressed.

6.5.2 The Status Bar



The battery gauge indicates how much charge remains.

Battery Gauge	Meaning
	Battery full
	Battery almost full
	Battery half full, drive towards a charger
	Battery low, recharge soon
	Battery almost empty, recharge now
	Battery empty, recharge immediately

Please see section 7 for more information on charging your batteries

The system status is normally hidden. If a fault occurs, a wrench icon will show, together with a fault code number. Please contact your Magic Mobility Dealer should this happen.

The indicator icons and side light icons will show when the lights are on.

The real time clock shows the time in 24hr format. The time can be adjusted in on board programming mode

6.5.3 System Lock

The joystick can be locked by pressing the on/off button for more than 4 seconds.
To unlock the system, press the on/off button and then press the horn button twice within 10 seconds

6.5.4 On/Off Button

Press the on/off button once to turn the joystick on and once to turn it off.

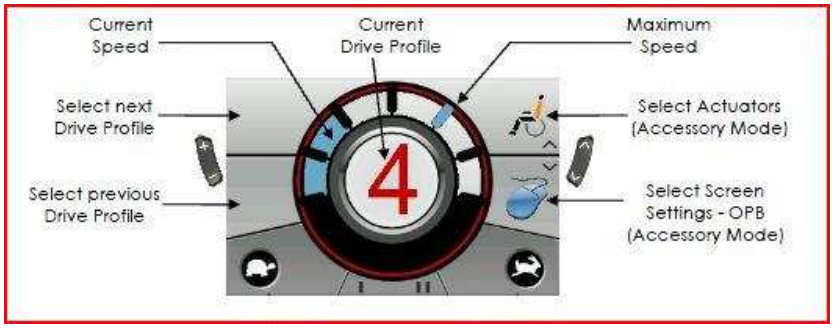
6.5.5 Sleep Mode

The DX2 system will go to sleep after a period of inactivity; this is to reduce energy consumption. To wake up the system, press any key.

6.5.6 Attendant Mode

Attendant mode is selected when the attendant switch on the attendant control is activated. All joystick navigation is then controlled by the attendant. However, the buttons on the controller will still work.

6.5.7 Drive Mode

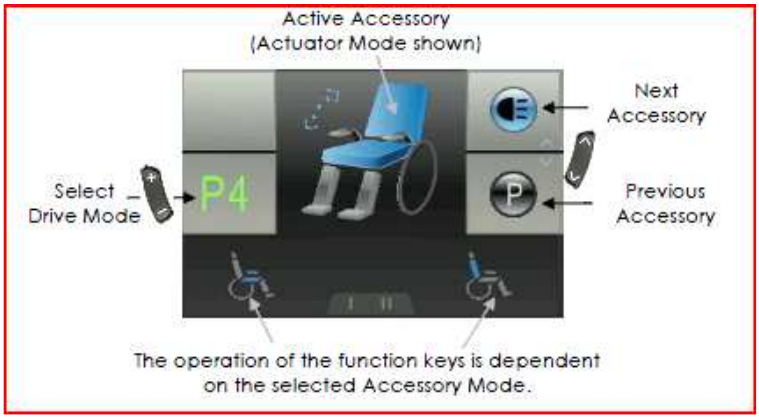


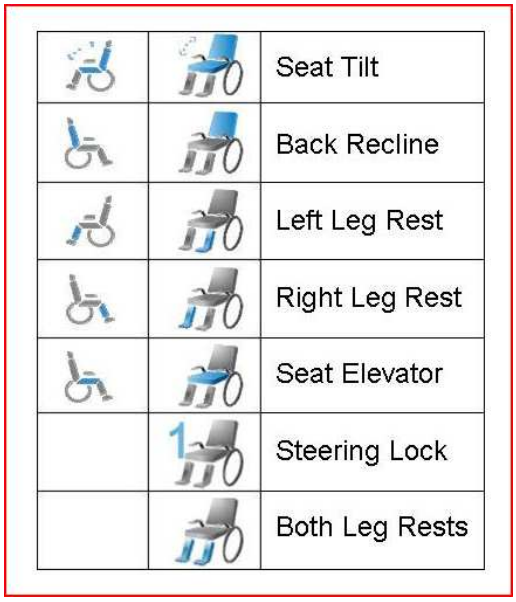
Use the drive profile selection button to increase or decrease the speed profile.

The selected speed profile will be shown in the center of the display

6.5.8 Accessory Mode

If you are in Drive Mode, a press of the accessory mode selection button will take you to the last used accessory function, e.g. actuator control. If you are already in Accessory Mode, a press of the accessory mode selection will take you to the next available accessory mode, e.g. lighting. To return to Driving, simply press the drive profile selection button.





Only actuators that have been enabled are detected and shown.

The next actuator can be selected by moving the joystick to the left or to the right or by using the function button

6.5.9 On Board Programming

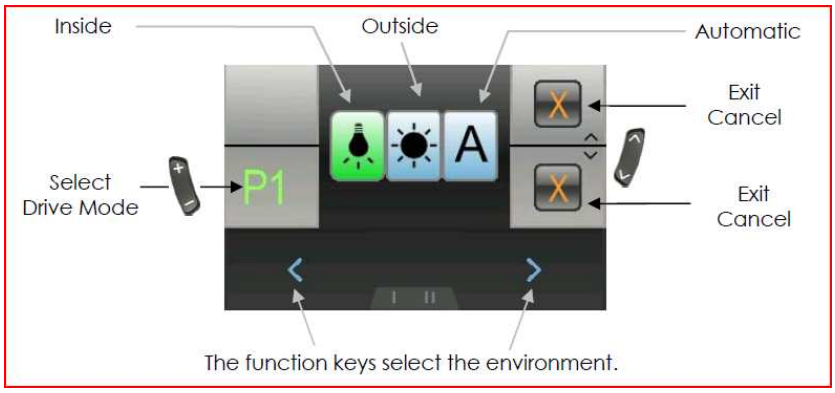
OBP Menu Items	
Menu Item	**Icon**
Screen Brightness	
Real-Time Clock time adjustment	
Real-Time Clock visible (yes/no)	
Screen Environment (inside/outside)	

The On Board Programming (OBP) can be used to make the following adjustments using the joystick controller.

Screen Brightness:

Using either the function buttons or the joystick left/right to change the screen brightness
Joystick forward/reverse or the accessory buttons accepts the new setting and returns to the main OBP menu.

Screen Environment Setting (Inside/Outside):

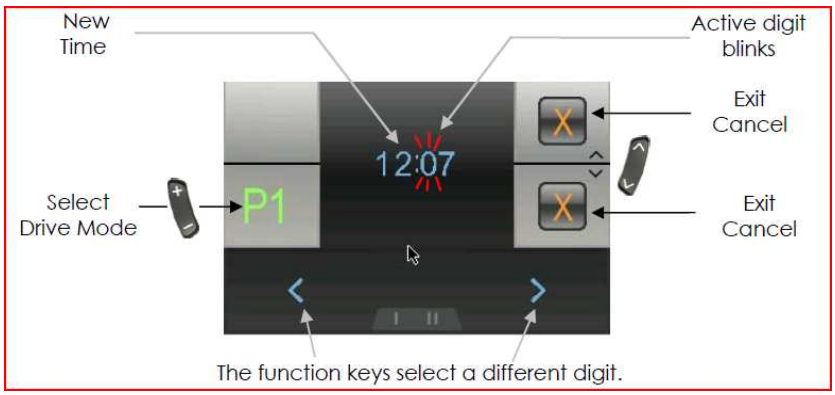


There are 3 options:

- Inside – The screen has a black background
- Outside – The screen has a white background
- Automatic – The background is set automatically depending on the ambient light

Use either the function buttons or joystick left/right to select the environment
Joystick forward accepts the new settings and returns to the main OBP menu
Joystick reverse or the accessory buttons cancel the new settings and returns to the main OBP menu

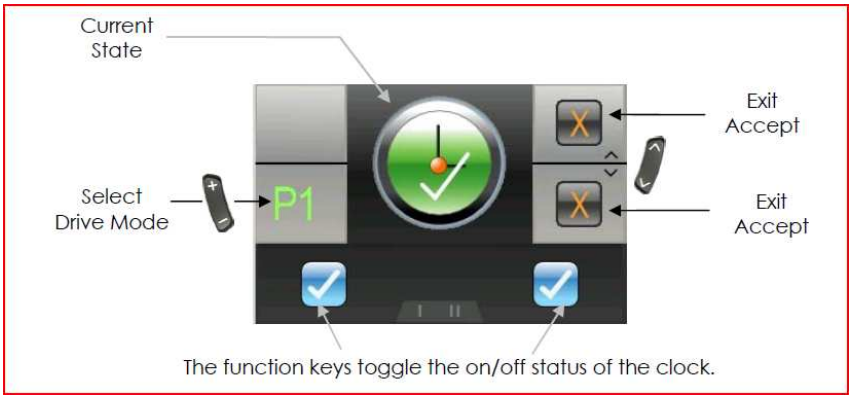
Adjust the time of the clock:



Use either the function buttons or joystick left/right to select a different digit
Joystick forward increases the value of a digit
Joystick reverse accepts the new settings and returns to the main OBP menu

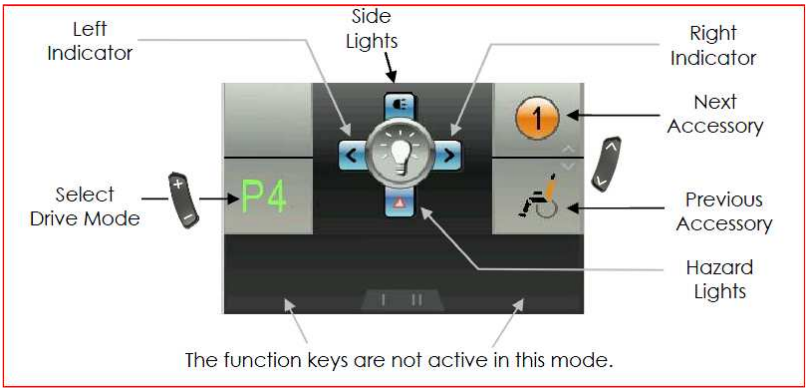
The accessory buttons cancel the new settings and returns to the main OBP menu

Clock visibility:



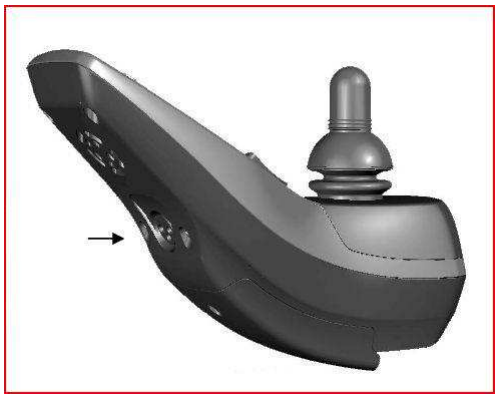
Use either the function buttons or the joystick left/right to toggle the on/off status
Joystick forward accepts the new settings and returns to the main OBP menu
Joystick reverse or the accessory buttons cancel the new settings and returns to the main OBP menu

6.5.10 Lighting Mode (if lights fitted)



The indicators can be activated with the indicator buttons on the controller. Alternatively, press the accessory mode selection button until the screen shows that you are in lighting mode. Moving the joystick forward turns on the head lights and tail lights. Moving the joystick rearward turns on the hazard lights. A left or right movement of the joystick turns on the corresponding indicator.

6.5.11 Charging



Plug the battery charger into the charging socket located at the front of the G90 Remote.

Driving is inhibited while the system is being charged

Once the Battery Charger displays a ‘full’ battery charge, the battery charger plug may be removed.

7 Batteries & Charging

7.1 Batteries

Your Power Chair uses high quality long lasting AGM batteries that are sealed and maintenance free. There is no need to check the electrolyte fluid level they contain. Despite their similarity to automotive batteries, they are not the same. Automotive batteries are not designed to handle a long, deep discharge, and are also unsafe for use in power chairs.

	WARNING! Battery posts, terminals, and related accessories contain lead and lead compounds, wash your hands after touching. WARNING! Corrosive chemicals are contained in the batteries. Use only AGM or gel-cell batteries to reduce the risk of leakage or explosive conditions. WARNING! When fitting alternate batteries, ensure their terminal posts cannot touch any part of the wheelchair frame
	STOP! Automotive batteries and chargers are unsafe for use in power wheelchairs

7.2 Battery Charging

We recommend using only a high quality dual rate intelligent battery charger with your Power Chair. Only use the supplied off-board charger unless otherwise approved by Magic Mobility. Do not use an automotive-type battery charge.

Fully recharge any new batteries prior to use. Operate the power wheelchair around the house and grounds; do not travel too far until you are accustomed to the controls. After this first use; fully charge the batteries. After 4 or 5 cycles, the batteries will perform to their fullest potential.

The charger will not operate after the batteries have been discharged to an extremely low voltage. If this happens, call your Magic Mobility Dealer for assistance.

7.3 Charging Procedure

Battery Charging is via a socket within the joystick module. When a charger is plugged in, the joystick unit recognizes the unit is plugged in and chair driving is inhibited.

The following procedure is valid for the recommended charger brand - consult your separate charger instructions if supplied with an alternative charger.

1. Ensure the wheelchair is turned off.
2. Always make sure that the charger is turned off before plugging it into the wheelchair.
3. Plug the charger into the charging socket on the joystick module.
4. Please consult the instruction manual supplied with your charger for detailed instructions

The following advice is recommended to help care for your batteries:

- Keep your batteries fully charged and avoid deeply discharging your batteries.
- The wheelchair will require charging for 8 to 10 hours for a full charge. Charging the batteries for short periods will shorten the life of the batteries.
- Do not charge the batteries for more than 24 hours at a charging cycle if possible.

- If the power wheelchair is used every day then the batteries should be charged overnight every night.

	WARNING! Always protect the batteries from freezing and never charge a frozen battery. Doing so can result in personal injury and damage to the battery
	STOP! Do not put the charger on the seat of the wheelchair when charging as the charger can become quite warm. Always put the charger on the floor near the chair when in use.

To get the maximum range from your batteries:

- Fully charge the batteries prior to the trip
- Avoid stop-go driving; try to maintain a constant speed
- Try to avoid inclines
- Limit baggage weight carried

7.4 Public Transportation

The AGM batteries are Federal Aviation Administration (FAA) approved, allowing safe transportation on aircraft, buses and trains. However, Magic Mobility recommends that any specific requirements of the carrier are checked in advance.

7.5 Battery Disposal and Recycling

If you encounter a damaged or cracked battery, contact your Magic Mobility Dealer for instructions on disposal. Your Magic Mobility Dealer will also have all the necessary information on battery recycling, which is our recommended course of action.

8 Care & Maintenance

Like any motorized vehicle, your power chair requires routine maintenance checks. You can perform some of these checks, but it is recommended that every 12 months the chair is inspected by a factory authorized service facility. Repairs or replacements should only be carried out with manufacturer-approved components to assure proper performance (see section 9, Servicing).

	STOP! Do not use parts, accessories, or adapters other than those authorized by Magic Mobility. This may void your warranty and cause damage to your power chair.

8.1 General Guidelines

Do not expose your power chair to any type of moisture at any time (rain, snow, mist, salt water, or wash). Such exposure can damage your power chair. Should your power wheelchair come into contact with water, dry as thoroughly as possible with a towel and then allow it to sit in a warm room for 10-12 hours to dry. Check the joystick operation and brakes before using your power wheelchair. If there are any doubts or inconsistencies with your wheelchair, please contact your Magic Mobility dealer

Avoid knocking or bumping the controller, especially the joystick.
Keep the controller clean

Avoid exposure to extreme temperatures
Do not place the controller cable so it may be pinched in any of the seat or power base frames

	STOP! DO NOT leave the power wheelchair in rain or a storm of any kind. DO NOT use the power wheelchair in a shower or leave it in a damp bathroom while taking a shower. DO NOT leave power wheelchair in a damp area or outdoors for any length of time. Direct exposure to rain or damp will cause electrical and mechanical malfunctions and may cause the chair to prematurely rust.

Some parts of the power wheelchair are susceptible to extremes of temperature. It is possible for the batteries to freeze. The temperature at which the batteries freeze depends on a number of factors including their chemical composition, the level of charge and their usage. At elevated temperatures; the power wheelchair may operate at a reduced speed. This a safety feature built into the controller to protect the motors and other electrical components.

8.2 Batteries

The batteries used in your power chair are sealed, no maintenance gel cells and require only correct charging procedures - see 7.2 Battery Charger. Typically these batteries would last 1 to 2 years; depending upon type of usage.

8.3 Tires and Castors

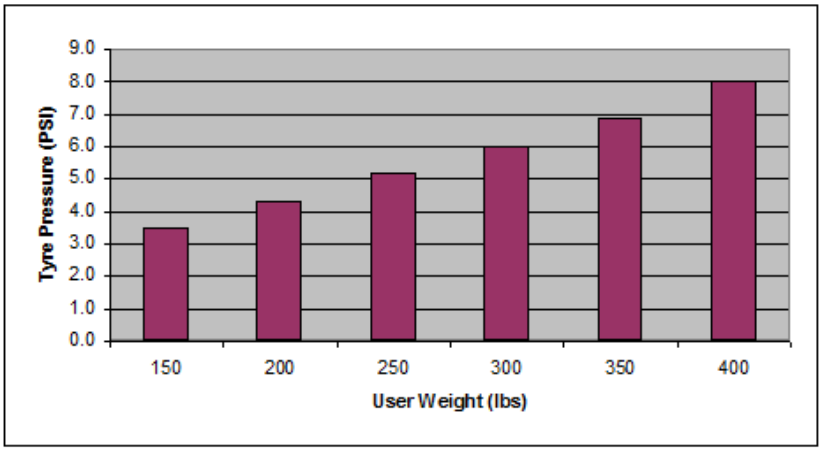
8.3.1 Tire Inflation

	Tire Description	**Recommended Optimum Operating Pressure**	Tire Pressure
FRONTIER			
Mid Drive Tires	12 ½ x 2 ¼ pneumatic	**35 psi** (241kPa)	30 – 40 psi (207 – 275 kPa)
Castors	200mm MCP solid	NA	NA
FRONTIER ALL TERRAIN			
Mid Drive Tires	Black, Low Pressure, Knobby	**3.6 psi** (25 kPa) Also, see chart below	3.6 - 24 psi (25 – 165 kPa)
Castors	250mm Pneumatic (All Terrain Model)	**36 psi** (248kPa)	36 psi 248 kPa

TYRE INFLATION PRESSURE Magic Mobility

X5 All Terrain	X4
Min: 3.5 psi	Min: 3.5 psi
Max:8 psi	Max:8 psi

Lower tyre pressures provide more traction in mud, sand and snow. For use on firmer surfaces, tyre pressures may be increased up to a maximum of 8 psi depending upon the weight of the user, their preferences and driving capability. The chart below may be of some assistance when increasing tyre pressures. It is not recommended that tyre pressures greater than 8 psi are used.



Tire pressures should be checked weekly. All pneumatic tires are fitted with automotive type valves and can be inflated using most typical automotive hand and foot type pumps as well as service station air outlets.

	STOP! Under inflated tires may be dangerous and can leave the tires prone to punctures. Failure to use the correct inflation pressure can result in reduced performance or cause an unsafe situation to occur
	STOP! Over inflated tires may cause the tire to explode and cause bodily harm. The recommended tire pressure is also listed on the sidewall of the tire

8.3.2 Tire Wear

Tire wear varies greatly depending on usage (from months to years), but no matter what sort of time your tires last this is mostly governed by your typical daily requirements. To achieve the most from your tires it is important to have them correctly inflated. Always use manufacturer recommended parts. Replace tires when the tread pattern wears to less than 2mm in depth as tires will start to lose safe traction and can be more prone to puncture.

8.4 Upholstery

The power chair upholstery may be cleaned using mild soap and water. Avoid getting water into any electric components. Never use any chemicals to clean a vinyl seat, as they may cause the seat to become slippery, or dry out and crack. A general purpose upholstery cleaner may be used on velour.

Upholstery life may be affected by skin oils and human perspiration particularly that are caused by particular medications. It is recommended that should cracking or significant wearing of the upholstery occur, it should be replaced.

8.5 Cleaning

Your power chair has a powder coated metal frame that allows it to be easily wiped clean with a damp cloth. Never hose off or pressure clean your power chair or place it in direct contact with water.

8.6 Storage

Store your Magic Mobility power chair in a warm dry environment. If you do not use your power chair regularly, it is recommended that the batteries be charged at least once per week.

If you are storing your power chair for an extended period of time, please contact your Magic Mobility Dealer who can give you advice on disconnecting the batteries and blocking up the power chair to avoid flat-spotting the tires.

	WARNING! Battery posts, terminals, and related accessories contain lead and lead compounds, wash your hands after touching.
	WARNING! Corrosive chemicals are contained in the batteries. Use only AGM or gel-cell batteries to reduce the risk of leakage or explosive conditions.

8.7 Transportation

Always be sure your power chair and its components are properly secured when it is being transported. Please contact your Magic Mobility Dealer for advice regarding packing and shipping your particular chair.

8.8 Daily Checks

Turn off the controller and check the joystick. The joystick should return to center and not be bent or damaged in any way. Ensure the joystick boot is not torn or cracked where water can enter and that all electrical connections are secure.

	STOP! Do not use the joystick if the boot is torn or cracked. If the joystick boot becomes torn or cracked, ensure it is replaced IMMEDIATELY.

8.9 Weekly Checks

Visually inspect the controller harnesses. Ensure they are not frayed and have any wires exposed.
Check the tire and castor pressure is to the specification as detailed in section 8.3
Check the tires and castors for wear
Check the brakes by pushing the joystick slowly forward until you hear the electric brakes click. Immediately release the joystick. The brakes should operate with a few seconds of moving the joystick. Repeat this test by pushing the joystick rearward, left and then right.

Visually check the castor forks for any damage and ensure the castors swivel freely without squeaking.
Keep your power chair clean and free from foreign material.

	STOP! If any of the above checks reveal a problem, please see your Magic Mobility Dealer for repair.

8.10 Annual Checks

Take your power chair to your Magic Mobility Dealer to ensure it is functioning correctly (see section 9)

9 Servicing

If you notice symptoms such as motor noise, frayed harnesses, damaged connectors, uneven tire wear, unusual motion or broken parts or anything else that may be a cause for concern between services, please also contact your Magic Mobility Dealer immediately. If required, Head Office can help you find your nearest Dealer (see section 12).

Set-Up of the Electronic Control Unit is to be performed ONLY by individuals authorized by Magic Mobility. The final tuning adjustments of the controller may affect other activities of the wheelchair.

	STOP! If non-certified individuals perform any work on these units, the warranty is void and damage to the equipment could occur.

Do not modify, or have your power chair modified in any way not authorized by Magic Mobility. Unauthorized changes constitute remanufacturing of the wheelchair. The person or group who make the changes will have full liability of the wheelchair under the Therapeutic Goods Act (TGA).

	WARNING! Unauthorized modifications void your warranty and may result in personal injury.
	STOP! Unauthorized modifications void your warranty, constitute remanufacturing and may render your chair unsafe.

10 Fault finding

During fault conditions the chair either will not drive or drives very slowly.

10.1 Limp Mode

If the DX system detects a fault that does not demand the wheelchair be stopped completely; it will go into 'Limp Mode'. This enables the wheelchair to be driven to a safe place at a reduced speed.

10.2 Stuck Power Button

If the power button is pushed and not released; the system switches off. To unlock the system, press the on/off button and then press the horn button twice within 10 seconds (Section 6.5.3)

10.3 Joystick out of neutral at power up

If the joystick is not in the center position when the system is switched on; the wheelchair will not drive. This is to prevent inadvertent movement. If the joystick is returned to the center within 4 seconds the chair will then drive normally. If the joystick is not returned to center within 4 seconds, the DX2 system must be switched off and then on again.

10.4 Battery Warning Conditions

Check the batteries are charges. If the charge icon is red, put the chair on charge immediately

Warning Icon	Meaning
	Battery overcharged. • Slow down and turn on the lights (if fitted).
	Battery completely empty. System turns off. • Recharge.

Note if the batteries are allowed to discharge completely, they may not recharge (see section 7) in the event of this happening please contact your Magic Mobility Dealer for assistance.

10.5 Fault Codes

In the case of a fault; the DX2 controller may display a flash code like the one pictured. The number indicates where the problem is in the system. The following information may help diagnose some faults

1	Turn the DX system off the back on again Check the lead to the joystick module – has it been damaged or dislodged If the above do not clear the fault, please contact your Magic Mobility dealer
2	This may not be a fault. If you have a seat elevator, the wheelchair is programmed to drive slowly when the seat is elevated. The flash code is indicating that the chair's speed has been reduced while elevated. Ensure the seat is in its lowest position before driving If the above do not clear the fault, please contact your Magic Mobility dealer
3	Left Motor Fault – usually indicates a poor connection. Check that the motor cables are not loose or disconnected. If the above do not clear the fault, please contact your Magic Mobility dealer

4	Right Motor Fault – usually indicates a poor connection. Check that the motor cables are not loose or disconnected. If the above do not clear the fault, please contact your Magic Mobility dealer
5	Left Electromagnetic Brake Check that the electromagnetic brake release levers are fully engaged (section 5.3) Check that the motor cables are not loose or disconnected. If the above do not clear the fault, please contact your Magic Mobility dealer
6	Right Electromagnetic Brake Check that the electromagnetic brake release levers are fully engaged (section 5.3) Check that the motor cables are not loose or disconnected. If the above do not clear the fault, please contact your Magic Mobility dealer
7	Low Batteries Charge the batteries Check the battery leads and connections. Also check the fuse has not blown (section 5.4). If the above do not clear the fault, please contact your Magic Mobility dealer
8	Battery Over Voltage Slow your driving speed down Check the leads and connectors. If the above do not clear the fault, please contact your Magic Mobility dealer
9	Check the all electronic leads for damage If the above do not clear the fault, please contact your Magic Mobility dealer
10	Check the all electronic leads for damage Make sure the hazard lights (if applicable) are turned off then turn the DX2 power off then back on again. If the above do not clear the fault, please contact your Magic Mobility dealer
11	The motors have been at their current limit for too long. Turn the DX2 system off and let the motors cool down. If you are attempting a steep incline; seek an alternate route. If the above do not clear the fault, please contact your Magic Mobility dealer
12	Please contact your Magic Mobility dealer

10.6 Electromagnetic Interference (EMI) From Radio Wave Sources

Powered Wheelchairs may be susceptible to electromagnetic interference (EMI), which is interfering electromagnetic energy (EM) emitted from sources such as radio stations, TV stations, amateur radio (HAM) transmitters, two-way radios and cellular phones. The interference (from radio wave sources) can cause the powered wheelchair to release its brakes, move by itself, or move in unintended directions. It can also permanently damage the powered wheelchair's control system. The intensity of the interfering EM energy can be measured in volts per meter (v/m). Each powered wheelchair can resist EMI up to a certain intensity. This is called its "immunity level" The higher the immunity level, the greater the protection. At this time, current technology is capable of achieving at least a 20 v/m immunity level, which would provide useful protection from the more common sources of radiated EMI. This powered wheelchair model as shipped, with no further modification, has an unknown immunity. There are a number of sources of relatively intense electromagnetic fields in the everyday environment. Some of these sources are obvious and easy to avoid. Others are not apparent and exposure is unavoidable. However, we believe that by following the warnings listed below, your risk to EMI will be minimized.

The sources of radiated EMI can be broadly classified into three types:

1) Hand held portable transceivers (transmitters-receivers) with the antenna mounted directly on the transmitting unit. Examples include: citizens band (CB) radios, "walkie talkie," security,

fire and police transceivers, cellular telephones, and other personal communication devices. **NOTE: Some cellular telephones and similar devices transmit signals while they are ON, even when not being used;

2) Medium-range mobile transceivers, such as those used in police cars, fire trucks, ambulance, and taxis. These usually have the antenna mounted on the outside of the vehicle; and

3) Long range transmitters and transceivers, such as commercial broadcast transmitters (radio and TV broadcast antenna towers) and amateur (HAM) radios.

NOTE: Other types of hand-held devices, such as cordless phones, laptop computers, AM/FM radios, TV sets, CD players, and cassette players and small appliances such as electric shavers and hair dryers, so far as we know are not likely to cause EMI problems to your powered wheelchair.

10.7 Powered Wheelchair Electromagnetic Interference (EMI)

Because EM energy rapidly becomes more intense as one moves closer to the transmitting antenna (source), the EM fields from hand-held radio wave sources (transceivers) are of special concern. It is possible to unintentionally bring high levels of EM energy very close to the powered wheelchair's control system while using these devices. This can affect powered wheelchair movement and braking. Therefore, the warnings listed below are recommended to prevent possible interference with the control system of the powered wheelchair.

WARNINGS
Electromagnetic interference (EMI) from sources such as radio and TV stations, amateur radio (HAM) transmitters, two way radios and cellular phones can affect powered wheelchairs.

Following the warnings listed below should reduce the chance of unintended brake release or powered wheelchair movement which could result in serious injury.

1) Do not operate hand held transceivers (transmitter-receivers), such as citizens band (CB) radios, or turn ON personal communication devices, such as cellular phones, while the powered wheelchair is turned ON.

2) Be aware of nearby transmitters, such as radio or TV stations, and try to avoid coming close to them;

3) If unintended movement or brake release occurs, turn the powered wheelchair OFF as soon as it is safe.

4) Be aware that adding accessories or components, or modifying the powered wheelchair, may make it more susceptible to EMI (note: There is no easy way to evaluate their effect on the overall immunity of the powered wheelchair); and

5) Report all incidents of unintended movement or brake release to the powered wheelchair manufacturer, and note whether there is a source of EMI nearby.

Important Information

1) 20 volts per meter (v/m) is a generally achievable and useful immunity level against EMI (as of May 1994) (the higher the level the greater the protection)

2) This product has an unknown immunity.

United States of America (ONLY)
Caution: Federal law restricts this device to sale by or on the order of a practitioner licensed by the law of the State in which he/she practices.

11 Warranty

This wheelchair is provided with a 12 month Limited Warranty on the parts and workmanship contained within.

This warranty does not cover wearing items such as tires, batteries, upholstery etc.

The warranty does not cover freight to or from the manufacturer, that is, the chair must be returned to the factory or Dealer, freight pre-paid, for all warranty repairs.

The warranty on this power chair does not cover breakages / damage to either the motors, gearboxes, or axle shafts caused by misuse of the wheelchair.

Warranty does not cover faults, failures or excessive wear caused by lack of appropriate maintenance and regular servicing by authorized repairers as outlined within this owners manual.

We will, at our discretion, repair / replace items that we consider were faulty at time of manufacture.

The availability of replacement units is subject to the discretion of the provider, not the manufacturer. For more information regarding replacement units, contact your Magic Mobility Dealer.

All warranties are detailed in “Terms & Conditions of Sale - Magic Mobility” (available upon request)

Upon acceptance of goods at delivery the purchaser accepts the “Terms & Conditions of Sale”

12 Head Office and Operations

This wheelchair has been proudly manufactured in Australia.

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